

# RESEARCH HIGHLIGHT

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## A Discussion Paper on Indoor Air Quality Investigations of Houses Used for Marijuana Grow Operations

### INTRODUCTION

This document follows from a November 2004 RCMP Marijuana Grow-Operation Conference which brought together industry stakeholders and various experts in the field, including CMHC, to discuss issues and explore potential solutions to the increasing incidence of indoor residential marijuana grow operations (MGOs) in Canada. As a result, CMHC undertook a study of a small number of homes used as MGOs with the intention of gaining a better understanding of the physical damage and the environmental contamination present, and to summarize key findings that could be shared with other stakeholders.

### INVESTIGATION OF A SAMPLE OF MGOs

#### Method

CMHC sampled 12 former MGOs across Canada. Access to 11 houses was obtained after repossession by mortgage lenders. One house was volunteered by a homeowner who had unknowingly purchased a former MGO. This was the only house occupied at the time of study; the other homes had been unoccupied for various periods of time.

CMHC invited eight individuals who had completed CMHC's Residential Indoor Air Quality (IAQ) Investigator Training Program to participate in the study. This program provides qualified individuals with the competency to investigate residences for indoor air quality problems, including moisture and mold. Although applicable, the training is not specific to MGOs.

The investigations followed the established CMHC Residential IAQ Investigation Procedure, which is based on a thorough walk-through and analysis of the premises and concludes with the preparation of a report for the owner of the house. This CMHC investigation procedure does not rely on laboratory testing of mold or chemical contaminants.

At the time of the investigations, because law enforcement officers had already removed all plants, chemicals and growing equipment, risks to first responders could not be evaluated as part of this study. Nevertheless, the IAQ investigators followed precautions by wearing personal protective equipment during their investigations.

At the conclusion of each investigation, a report addressed to the property owner was prepared. The report identified safety issues and provided a list of recommendations for rehabilitation of the house. Recommendations were prioritized according to importance and identified as low-, medium- or high-cost. Detailed procedures for cleanup or remediation were cited from CMHC publications such as CMHC's *Clean-Up Procedures for Mold in Houses*, or authoritative documents such as the New York City Department of Health's *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, and Health Canada's *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods* (2004).

### FINDINGS

#### House types and areas used for growing

The houses studied were detached one-, two- and three-storey homes that ranged in age from two to 95 years. The extent to which the homes were used in the grow operation varied from the garage only, to all rooms in the house. In most cases, the grow operations were conducted in the basement only.

#### Duration of the grow operation

With the exception of one house which was operated as an MGO for four months, in all other cases the length of time that the houses were used as MGOs could not be accurately determined. For the purpose of this study, estimates of the duration of the grow operations were based on the damage sustained by the homes.

## Ventilation, heating and electrical changes

Alterations made to accommodate ventilation equipment for the grow areas were noted in most cases. Although the ventilation equipment had been removed by police, holes cut in walls and ceilings used to vent the moisture into the attic, the garage, or up the chimney were visible. Other evidence of alterations were disconnected heating ducts, addition of wiring, electrical assemblies and electrical panels that had been tampered with.

## Mold contamination

Seven houses had extensive mold contamination visible on walls, ceiling and/or wood. Two houses had moderate mold contamination and one house had no signs of moisture damage or mold. In one case, mold was found behind the painted drywall.

A musty smell was detected in nearly all of the houses, particularly in the basement or grow areas. The extensively contaminated houses had a strong musty smell throughout.

## Chemical contamination

The growing equipment and most of the chemical containers had been removed by the police at the time of the CMHC investigation. Therefore, the investigations could not determine the types of chemicals used, or the extent to which they were applied. The chemical component of MGOs will be the subject of a future study.

## Remediation recommendations

Recommendations were specific to each house. The investigation reports identified safety concerns and indoor air quality problems, including those that might not have been directly related to the grow operation. The reports also recommended that homeowners consult with a structural engineer when necessary, and engage the services of qualified HVAC (Heating, Ventilation and Air-Conditioning), plumbing and electrical contractors.

Extensive and costly renovation was recommended in the majority of the subject houses. Demolition was recommended only in the case of a garage that had been used as an MGO for an extended period.

In all of the subject houses, the investigators stressed the need to gut the basements and all other rooms used for growing, and to ensure that there was no mold in the insulation or wall cavity after the drywall was removed. Contractors specifically trained in mold remediation were recommended for this purpose. The investigators indicated that safety precautions and remediation procedures might need to be adjusted if the mold was found to be more extensive than originally anticipated.

They also recommended checking for the presence of mold in other areas of the house, especially when the grow operation was extensive or prolonged and/or moisture management was inadequate. Blower door tests were recommended to ensure the integrity of the building envelope.

## DISCUSSION

### Assessment of grow houses

With the exception of publications intended solely for mold remediation, the availability of guidance for the homeowner regarding the rehabilitation of MGOs is limited. By the conclusion of the CMHC study, several municipalities in Alberta and British Columbia had created bylaws that included specific instructions for the remediation of MGO houses. Although these guidelines may be adequate to restore a former MGO home to habitable condition, there are minor discrepancies between the requirements of individual municipalities. An harmonized approach to the remediation of MGO houses nationwide would be preferable.

In the absence of municipally legislated requirements, remediation of former MGO houses is normally performed at the discretion of the current property owner. When former MGO houses become the property of mortgage lenders, the remediation is often based on the established protocol for generic environmental contamination which may involve some form of environmental assessment.

The consensus among authoritative agencies, such as the Environmental Protection Agency (EPA), Health Canada and CMHC, is that a thorough building inspection is the first step in assessing for mold and other indoor air quality problems. In the majority of houses, laboratory testing for mold alone is not adequate for determining the nature and extent of contamination and should never be done without a prior or concurrent inspection by a qualified and experienced person (Health Canada 2004).

The extent of required remediation in CMHC's sample of 12 MGOs varied. The determining factors included the size and duration of the operation, structural modifications made, presence of protective coverings on walls, floor and ceiling in the growing area(s) and moisture conditions. A thorough investigation was necessary in each case. Because the investigation report becomes the basis of the work specifications, it is important that the investigator be appropriately trained.

### Remediation of former MGOs

Municipal legislation and/or regulations that apply to the remediation of former MGOs may be imposed by the municipality upon the homeowner at the time the grow operation is discovered by the police. Municipal by-laws can provide some guidance but are not sufficiently detailed to be used as a stand-alone reference by the homeowner.

The initial investigation should be carried out by contractors with suitable qualifications and experience who have been additionally trained in the investigation of grow operations and other illegal drug production operations. While training programs specific to MGOs are not yet available in Canada, discussions among various stakeholders, including CMHC, have taken place in the wake of the National Grow-Operation Conference in late 2004.

It is critical that the property owner employs renovation contractors who are specifically trained in mold remediation. Typically, training for mold remediation contractors is for mold cleanup and does not include identification of the causes and corrective measures. The investigation is a necessary and independent step prior to the remediation.

To ensure that cleanup of mold is thorough and the underlying causes are corrected, it is recommended that a qualified professional be retained after the initial assessment to oversee the remediation process. Health Canada (2004) describes the remediation documentation requirements and general procedures for mold and contains references to more detailed material.

Broadly, the documentation must include the IAQ investigation and assessment, a description of the remediation work, the monitoring process during the renovation and the post-renovation quality assurance process. The document should also include the name of the individual who conducted the work, the findings, the recommendations and the results.

Analogous procedures are indicated for chemicals. This matter is under study by CMHC.

It is recommended that detailed records of all remediation activities be maintained as this may improve future marketability of the home.

### **Disclosure of former MGOs**

One subject in the study was a home purchased by a family who were unaware that their home was a former MGO until they spoke with neighbours several months after they took occupancy. It was discovered that the previous owner had undertaken to hide evidence of the grow operation rather than remediate the damage. As such, the mold-covered walls and ceilings had been painted over prior to the sale. At the time of the study, no avenues of recourse for the new owners had been identified and they had to assume responsibility for the total cost of remediation.

CMHC has since been contacted by several homebuyers in similar positions. Although it is not known how often this occurs, it has been related by law enforcement officers that it is becoming more common for marijuana growers to buy and sell the MGOs within a short time. The rapid recycling of houses is intended to avoid

detection by neighbours and police. The homes are superficially repaired and sold to unsuspecting buyers who may be unable to locate the previous owners. Where this occurs, new homebuyers can be unwittingly exposed to hidden contaminants from damage that was cosmetically covered over without proper remediation.

### **Safety of former MGOs**

The cultivation of large amounts of marijuana in confined spaces gives rise to safety issues involving mold from excess moisture, as well as contamination from the use of fungicides and insecticides, various solvents and other chemicals used for various purposes. Walls, ceilings and floors can be contaminated throughout the house and especially in the grow areas. Growers may have disposed of excess chemicals in an unsafe manner such as down the drains inside or dumping outside the house.

Further research work remains to be done to identify the chemicals being used in grow operations, develop procedures for testing chemical residues and determine appropriate measures for decontamination.

## **SUMMARY OF RECOMMENDATIONS**

The following issues of importance were highlighted during the study.

### **1. Nationwide harmonization of remediation requirements**

Some municipalities have legislated requirements for the remediation of ex-MGOs. These vary from municipality to municipality. A harmonized approach to MGO remediation would be preferable. In the absence of applicable bylaws, limited guidance is available to property owners responsible for MGO remediation.

### **2. Guidelines for mortgage lenders**

It is recommended that guidelines for the remediation of houses known, or suspected to have been used as marijuana grow operations, reflect a residential indoor air quality investigation specific to ex-MGOs, rather than a generic environmental assessment. More work is required to ensure that training for indoor air quality investigations of MGOs is appropriate and available.

### **3. Qualified contractors, standard protocol**

The investigation and remediation of former MGOs must be performed by qualified professionals. These include qualified structural, electrical and HVAC contractors as well as Residential Indoor Air Quality Investigators. It is recommended that a standard nation-wide protocol be developed.

### 4. Assessment

A preliminary assessment of the extent of contamination should be conducted by the IAQ investigator during the walk-through inspection. In many cases, invasive examination of finished walls will be required. The engagement of qualified professionals, and quality assurance in accordance with Health Canada (2004) and related guidelines, represents current best practice.

### 5. Prevention of unnecessary damage post-detection

Because they may be vacant for a period of time, former MGOs are often subject to severe water damage caused by burst pipes. This occurs after electricity, gas or oil utilities are disconnected and the house is left unoccupied during the winter. It is strongly recommended that if the utilities are to remain disconnected, the water supply be turned off by police after the investigation is concluded and the grow-op dismantled. The homeowner or property manager should ensure that the system is drained.

### 6. Record keeping

It is recommended that mortgage lenders and property owners retain detailed documentation of the steps taken to remediate the former MGO. This includes the initial assessment through to completion.

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### REFERENCES:

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### Housing Research at CMHC

Under Part IX of the *National Housing Act*, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.

This fact sheet is one of a series intended to inform you of the nature and scope of CMHC's research.

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